

15¢

\$5.50 A YEAR

September 11, 1954

VOL. 46, NO. 11 PAGES 161-176

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Northwest Passage

See Page 168

A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

where to look for organic chemicals...high speed film for high speed movies...
two silver salts in the infrared

List No. 39

This and every year, myriads of companies spawn numberless catalogs, each a jewel in the crown of some sales manager, each a brick in the edifices of the printing industry and the filing cabinet industry. Here we come with yet another and with the presumption to proclaim its advent an event. In support we



cite the reception accorded the 38 predecessors of the vivid turquoise *Eastman Organic Chemicals List No. 39*, which has just been mailed out to those who have told us in past years that they would want it.

We speculate sometimes on why the Eastman Organic catalog is in such high demand by working practitioners of science. Among the more tenable hypotheses, may be listed:

1. It's handy to have around a book weighing less than a pound that gives the *Chem Abstracts* names, laboratory-quantity prices, structural formulas, molecular weights, and melting or boiling ranges (observed, not just quoted) of a representative group of some 3500 organic compounds.

2. It provides a means of distinguishing between the hundreds of thousands of organic compounds known to exist and those actually obtainable by mail or phone order from a single, eminently responsible source (148 items have been added to the latter class in the new edition).

3. It provides routine but useful compilations on matters like pH indicators ranges; transparency regions of spectrophotometric solvents; reagents for a great host of

analytical tests; liquids for refractive index determination; listings of sugars, vitamins, amino acids, alkaloids.

Now is the time for anyone who needs to know about the availability of organic compounds for the laboratory and who has not yet received List No. 39 to demand it of Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company). Though the catalog is free for the asking and the rate of its distribution has been accelerating at a mad pace for the past 35 years, we are always running into deserving people who want it but don't have it. Can't figure that.

High speed boon

In Paris this month at an international symposium on high speed photography, we are announcing 16mm *Cine-Kodak Tri-X Negative Film*. We are making a scholarly and dispassionate exposition of the factors governing choice of emulsion characteristics for high speed motion pictures and in due course of the argument we bring out that the new film has at least twice the speed of the valiant old "Super-XX," with about the same graininess. The happy implication to the man with a *Kodak High Speed Camera* is that he can close down his lens to get more depth of field, or he needn't pour so much light on his subject.

Cine-Kodak Tri-X Negative Film is now obtainable from your Kodak dealer, not only spooled for the rigors of high speed cameras (and so labeled) but also for more orthodox 16mm movie cameras used in newsreel, industrial, and sports photography. ASA Exposure Indices for conventional work are 250 for daylight and 200 for tungsten. Actually, this film outstrips the vision of some exposure meter designers by often making possible a quite adequate picture under illumination so low that the photographer can't get any response out of his meter.

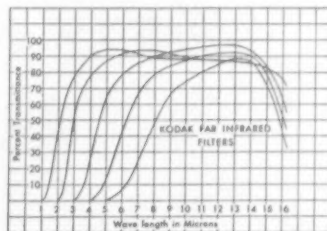
For a technical data sheet on *Tri-X* motion picture film, write Eastman Kodak Company, 343 State Street, Rochester 4, N. Y. We do not process this film.

Far infrared filters

The rock on which our house is founded is of gloriously photosensitive silver bromide. We now uncover to public gaze a small outcropping of two other silver salts of quite different function—silver chloride and silver sulfide.

Silver chloride in monocrystalline sheet is about as pliable as a fresh stick of chewing gum just out of the wrapper. When optically polished, AgCl becomes one of the most transparent of solids all the way out to 17μ in the infrared. We know a way to film over such a polished silver chloride plate with a smoke of silver sulfide. The result is a *Kodak Far Infrared Filter*.

Spectral transmittance depends on how the Ag₂S is applied. It's an empirical matter, involving a combination of spectrally selective scatter and absorbance, but we have nice control over it. We can deliver a filter with any specified specular transmittance, as delineated by this family of curves:



You designate any of nine equally spaced short-wavelength cut-offs from 1μ to 5μ , and we undertake to give it to you within a tolerance of $\pm .2\mu$.

For a full price schedule on Kodak Far Infrared Filters, write Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y. The lowest price per filter is \$28.50 in lots of 5 for the 1μ size with a cut-off between 1μ and 3μ . The highest standard price is \$131 for a 5μ filter with a cut-off between 3.5μ and 5μ . We quote three months' delivery but don't usually take that long. Keep watching for further developments of our excursion into that end of the rainbow where Sir William Herschel had the wit to stick his thermometer in 1800.

Prices quoted are subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are...serving laboratories everywhere

Kodak

GENERAL SCIENCE

A-Bomb Explosion Limit

"Repeated atomic explosions will lead to a degree of general radioactivity which no one can tolerate or escape," British Association for the Advancement of Science is told.

► THE HUMAN race can not stand more than a few thousand large atomic explosions whether they hit the target or miss, Dr. E. D. Adrian, British physiologist, warned in his presidential address to the British Association for the Advancement of Science meeting in Oxford, England.

Even if the world can survive the immense explosions and the great devastation of a major atomic war, Dr. Adrian said, "we must face the possibility that repeated atomic explosions will lead to a degree of general radioactivity which no one can tolerate or escape."

A few hundred large bombs would not raise the level of radiation to the point where it would be a general danger, Dr. Adrian said, but the known limits of radioactive contamination observed in industry and research would soon be ignored by powerful nations which might try to win quickly whatever the risk.

Dr. Adrian is president of Britain's famed Royal Society, master of Trinity College, Cambridge, and Nobelist in medicine and physiology in 1932.

"Unless we are ready to give up some of our old loyalties we may be forced into a fight which might end the human race," Dr. Adrian said.

"Our predicament is the inevitable result of our curiosity and of the physical nature of the world we live in, but if we can make our behaviour worthy of our increased knowledge we can live safely.

"The scientist, therefore, has a double responsibility. He must apply his science to learn as much as possible about the mental and physical causes which makes us behave as we do, he must study human nature to prevent its failures. But he cannot wait for the discoveries which might make us act more wisely: he must take us as we are and make it his task to point out that the human race cannot stand more than a few thousand large atomic explosions whether they hit their target or miss it.

"If we must continue to make war, there is no kind of scientific investigation which might not be used to make it more effective.

"There can be no guarantee that discoveries in the field of human conduct would be harmless. A drug or a system of education which would make us all do as we are told, a method of producing radical conversion to a new system of belief, a knowledge of new ways of rousing patriotic ardour, all these might be used with consequences almost as grim as the genetical deterioration in a radioactive world.

"The psychiatrist who discovers a cure for paranoia may find that he has also re-

vealed a convenient way of producing it," Dr. Adrian pointed out.

Discoveries relating to our own nature may mean a painful readjustment of our beliefs, Dr. Adrian said. He recalled the great discussion over Darwin's theory of natural selection a hundred years ago and drew a close parallel with the impact of Freud's theories on our own generation.

"The theory of unconscious forces moulding our thought has certainly diminished our stature as intelligent beings," he said.

"Yet the parallel still holds, for again we have recovered our equanimity. We are reconciled to the unconscious, though we may not have digested all the elaborations of psychoanalytic theory.

"We are no doubt less sure of ourselves, inclined to spare the rod and to put nothing in its place, but, on the whole, Freud has left us with a better understanding of human conduct and we are not downhearted at finding it less rational than we used to suppose."

Dr. Adrian urged that there be more investigations in the field of the social sciences, even though it is difficult for those who study social activities, so enmeshed with human actions, to do controlled experiments.

Even after it is discovered what is likely to happen in a particular situation, the statesman who consults an expert may not be able to act to prevent trouble.

"We may find out a great deal about the tensions which lead to war without seeing the way to keep ourselves clear of it," Dr. Adrian said.

Dr. Adrian is optimistic about the future, however.

"We are constantly acquiring new habits and new ways of thought.

"It does not take us very long to see the way round old quarrels. Darwin and Freud no longer trouble us. We are no doubt born with brains like those of our remote ancestors and when we are grown up, we have no more native intelligence than they had, but our brains must have been so modified by what we have learned that they are physically and chemically different, better adapted for the complex social life of our time.

"We have more knowledge at our disposal. If all goes well with our training the brains, we have ought to be more civilized than those of our fathers and those of the next generation more civilized than ours."

Science News Letter, September 11, 1954



SOLUTION CERAMICS—New and flexible ceramic coatings can be applied to a wide variety of materials by the process of solution ceramics, developed at Illinois Institute of Technology's Armour Research Foundation. The coatings, whose liquid nature is shown in the photograph, can be sprayed at only a few hundred degrees Fahrenheit and will adhere to almost any solid surface.

ANTHROPOLOGY

Ape-Man Victim of Fire

► PROMETHEUS, THE African ape-man widely believed by scientists to have been the first to use fire, is now judged to have been the victim of an accidental fire instead of using it to cook dinner.

Dr. Kenneth P. Oakley, anthropologist of the British Museum in London, came to this conclusion after a visit to the Cave of Hearths in the Makapansgat Valley, Central Transvaal. There he saw the four-foot-thick layer of what appeared to be cindery ash that African anthropologists have called the "basal hearth."

This "hearth" is generally regarded as the oldest proved evidence of the use of fire by Stone Age man in Africa.

Two unusual features of the "hearth" were noted by Dr. Oakley. In the first place, the layer of ash contained no fragments of charred bone to indicate that it had been used to prepare a prehistoric barbecue. Then, too, the ash lay directly on a clean surface of stalagmitic dripstone. This dripstone normally forms in such limestone caves, but generally only in the deep interior of caves.

On the other hand, Dr. Oakley points out, men do not usually light fires in the deep recesses of caves, but only at their openings.

Yet, he reasons further, if the dripstone had formed at the back of this particular

cave and then later a cliff fall had opened the cave up and brought what had been a deep recess up to a newly opened entrance, the scientist would expect to find a layer of soil or rock debris on the dripstone under the remains of the fire.

Samples of the ash from the basal hearth as well as that from overlying hearths were gathered by Dr. Oakley to send to London and Chicago for radiocarbon dating.

To check the value of the samples for the purpose, Dr. Oakley submitted pilot fractions to the British Museum for assay. No carbon was found in the sample from the "basal hearth," Dr. Oakley reports in *Nature* (Aug. 7).

This means that the ash is not the remains of a wood fire. It could be, Dr. Oakley suggests, calcined bat guano. The guano of insect-eating bats consists mainly of insect wings and wing covers, and is highly inflammable.

Of course, there is a possibility that Stone Age Man may have used bat guano instead of wood as fuel for his cooking fires. However, Dr. Oakley, because of the absence of charred bones and because the ash layer rests directly on the dripstone, is of the opinion that the fire was ignited from a natural grass fire burning outside the cave.

Science News Letter, September 11, 1954

PHYSICS

Power Without Limit

► A SOURCE of power without limit for the world lies in the same kind of reaction that occurs in the hydrogen bomb, the fusion of light chemical elements, Sir John Cockcroft, director of Britain's Atomic Energy Establishment at Harwell, predicted in his presidential address before the physics section of the British Association for the Advancement of Science meeting in Oxford, England.

Before we come to the end of our uranium fuel reserves, Sir John, a pioneer in atomic research, foresees the use of the conversion of some of the mass of hydrogen and other light elements into energy. Fusion will be turned from destruction to peaceful use, just as fission of uranium is now being applied to power plants.

"Energy is the essential basis for a highly developed civilization," Sir John said. "The application of nuclear fission, wisely guided, can ensure that for a millenium ahead mankind has all the energy needed to supply his ever-growing needs."

Reviewing work on the constitution of the heart of atoms, Sir John explained:

"We now have clear evidence for the building up of 'shells' of protons and neutrons in nuclei leading to singularities in nuclear properties as the shells are filled.

Thus the abundance of nuclear species with closed shells is higher than normal, they have more stable isotopes, their structure of excited levels is simpler.

"All this can be explained by invoking the type of nuclear force, which is characteristic of strong interaction between nuclear spin and orbital momentum. The energy levels can be calculated and filled up progressively rather like atomic shells are filled up, and the shell picture emerges.

"Nuclear structure differs, however, from atomic structure because there is no counterpart to the overriding strength of the nucleus in determining the electron orbits.

"So the collective motions of nuclei become important and they can have vibrational and rotational motions which can be checked experimentally."

Science News Letter, September 11, 1954

CHEMISTRY

New Kind of Silica Made and Identified

► A NEW kind of silica was produced and identified by Dr. Paul R. Keat, now of the Norton Co., Worcester, Mass., while

he was doing graduate work at Rutgers University, New Brunswick, N. J.

The silica is a very fine crystalline substance less dense and with a lower refractive index than quartz, the silicon-oxygen combination that is familiar in sand. It was manufactured under high temperature and pressure during laboratory experiments, using silicic acid or silica gel as the source of the silica.

The structure of the new silica is unique, and seems to be the cause of a slight contraction with temperature up to about 1,020 degrees Fahrenheit. Its identification is reported in *Science* (Aug. 27).

Science News Letter, September 11, 1954

SCIENCE NEWS LETTER

VOL. 66 SEPTEMBER 11, 1954 NO. 11

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORTH 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$3.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1954, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ALdorado 3-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Karl Lark-Horowitz, Purdue University; Kirtley F. Mather, Harvard University; Paul B. Sears, Yale University. Nominated by the National Academy of Sciences: Homer W. Smith, New York University; Edward U. Condon, Corning Glass Works; Harlow Shapley, Harvard College Observatory. Nominated by the National Research Council: Dana Baller, American Association for the Advancement of Science; Ross G. Harrison, Yale University; Leonard Carmichael, Smithsonian Institution. Nominated by the Journalistic Profession: Neil H. Swanson, Baltimore, Md.; O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal. Nominated by the Scripps Estate: Charles E. Scripps, Cincinnati, Ohio; Edward J. Meeman, Memphis Press-Scimitar; John T. O'Rourke, Washington Daily News.

Officers — President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Allen Long. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Nellie Jenkins. Production: Priscilla Howe, Interlingua Division in New York; Alexander Gode, Hugh E. Blair, 60 E. 11th St., GRamercy 3-5410.

BIOCHEMISTRY

Use B-12 To Study Red Cell Production

► THE REASON why some people are unable to manufacture red blood cells normally is being sought at the Los Angeles Veterans Administration Center and the University of California at Los Angeles Medical School through the use of radioactive vitamin B-12.

This vitamin is known to be essential in the blood building process. However, without the aid of some body substance, known as the intrinsic factor, B-12 is not utilized, resulting in pernicious anemia.

Because intestinal bacteria also produce vitamin B-12, it has been difficult to trace experimentally administered B-12. However, with the use of the radioactive form, which can be traced with radiation detecting instruments, the stomach has been fairly well established as the source of the intrinsic factor.

When the radioactive vitamin was administered to persons whose stomachs had been removed because of cancer, it was found that none was absorbed. However, with simultaneous administration of juices secreted by stomachs of healthy persons, the B-12 was absorbed normally.

Actually only a millionth of a gram of vitamin B-12 daily is required to maintain normal blood building activity. However, without aid of some substance in stomach secretions, the vitamin apparently cannot negotiate the small fraction of a millimeter across the intestinal lining to the bloodstream.

Participating in the study of radioactive vitamin B-12 are Drs. James Halsted, Marian Swendseid, Marvin Gasster and Ernst Drenick.

Science News Letter, September 11, 1954

PSYCHOLOGY

Drawing of Self Reveals Failings of Old Age

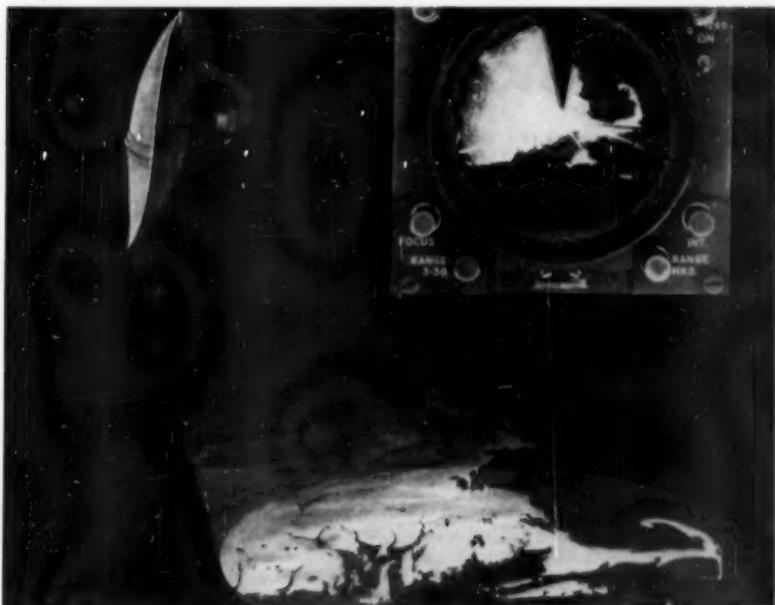
► WHEN AN old person takes a few minutes to draw a picture of himself as he would appear in a full-length mirror, he may reveal to a psychologist a true picture of his intactness or of the breakdown of personality that comes with age.

Psychologists at Teachers College, Columbia University, New York, compared such drawings made by 77 young graduate students with those made by 104 people from centers for old people.

The drawings of the old people contrasted with those of the students, Drs. Irving Lorge, Jacob Tuckman and Michael B. Dunn reported to the American Psychological Association meeting in New York.

"They are characterized by incompleteness, lack of integration, one or two dimensionality, lack of proportion, bizarreness and evidence of inadequate motor coordination," the psychologists found.

Science News Letter, September 11, 1954



PILOT'S RADAR—Artist's conception of the way U. S. Air Force's airborne Sperry radar APN-59 reproduces what the "turtle shell" antenna sees. The area shown is the region near Cape Cod, Mass.

TECHNOLOGY

Radar Maps Ground

► A RADAR set on display at the National Air Show, Dayton, Ohio, over Labor Day weekend, warns U. S. Air Force pilots of high mountain peaks, storms, tall buildings and nearby airplanes.

It presents a map of the area under the planes, displaying it on a five-inch screen.

Produced by Sperry Gyroscope Company for the Air Research and Development Command, the radar works at any height up to 50,000 feet, weighs only 150 pounds, and uses an 18-inch "turtle-shell" antenna that compensates for the pitch and roll of the plane.

Tests showed the set could "see" all around Lake Erie at once. It clearly showed Buffalo and Detroit, Toledo and Toronto, 250 miles apart at opposite ends of the lake.

The radar operates in the X-band, or 10,000-megacycle band of the spectrum.

A wide choice of range scales for the viewing screen can be selected by the operator, for close-up enlargements variable from three to 30 miles; or fixed ranges of wider areas at 50 miles, 100 and 240 miles.

Areas shown may be oriented to current heading of the aircraft, or to any desired compass bearing for exact measurement of drift.

One or more radar indicators may be operated with the system, and for larger planes an optional 30-inch antenna also is being produced.

Sub-miniature tubes and other miniature components are used so that the complete indicator and synchronizer units, including a five-inch radar screen, are contained within a compact aluminum case of only 70 cubic inches.

Science News Letter, September 11, 1954

ENGINEERING

Build New Laboratory With Wrenches Only

► A TWO-STORY laboratory is being built in Ann Arbor, Mich., by workers equipped only with wrenches. It will take weeks to construct, rather than the months required for a conventional building of the same size.

The structure uses a new architectural concept, the Unistrut Space Frame System of construction, which allows building unusually strong roof frameworks by introducing a third dimension of reinforcement.

Conventional roofs rest on beams or trusses running in two directions between walls. The space frame concept uses diagonal struts that permit stresses to be distributed in three directions.

The new building will be known as the Research Laboratory of the College of Architecture and Design of the University of Michigan.

Science News Letter, September 11, 1954

MEDICINE

New Kind of Jaundice

A pigment in the liver, yet to be identified, led to discovery of this chronic but not "catching" condition whose cause is so far unknown.

▶ A NEW kind of jaundice has been discovered in young people. It may be related, chemically, to a hereditary golden fleece condition of sheep.

The important thing about this new jaundice, however, is that the outlook is good. Those who have it can live normal and presumably long lives, although their skin and eye whites may turn yellow now and then. They do not need an operation and they do not need to spend weeks in bed. Their jaundice is not "catching."

The golden fleece link comes from examination of the livers of these people. Their livers contain a pigment, or color chemical, which so far has defied identification, but it may belong to the family of color chemicals called mesobilifuscins that the sheep with golden fleece excrete.

The golden fleece jaundice of humans was discovered by Drs. I. N. Dubin and Frank B. Johnson of the Armed Forces Institute of Pathology, Washington. They do not call it golden fleece jaundice. Their name for it is "chronic idiopathic jaundice with unidentified pigment in liver."

Translated, that means it is a chronic condition without, so far, any known cause and in which there is an unknown color chemical in the liver.

Discovery of this new kind of jaundice, however, may save many people from operations, long weeks in bed and chronic invalidism. It may save the armed forces many a healthy serviceman and it may save the United States many a dollar in pensions. All this because heretofore the new jaundice has been confused with or misdiagnosed as viral hepatitis or obstructive jaundice.

The new jaundice was discovered by some medical detective work, although no one had sent Drs. Dubin and Johnson on a new disease hunt.

Dr. Dubin's special job at the Armed Forces Institute of Pathology is to handle the bits of tissue, or sections, on glass slides, from the liver and bile tract. They are sent to the AFIP from Defense Department installations all over the world. So many of these arrive, especially now that viral hepatitis has become a widespread disease, that he sees more of the specimens and slides in two years than any other man might see in a lifetime.

Poring over these slides with his microscope, Dr. Dubin one day saw something he had never seen before. It was a section of perfectly normal-looking liver except that its cells contained striking amounts of brown material that he could not identify. The slide gave a picture unmistakably different from all the others.

When Dr. Dubin saw a second one like it, he went to the files at the AFIP and dug out all the slides of liver sections. He found that within the last two to three years, about a dozen of these strange liver sections had come in.

Next step was to get out the histories, or medical records, of the patients from whom the specimens came. Reading these over, he and Dr. Johnson saw that the symptoms and laboratory tests fell into a common pattern.

The patients were all young. Almost all had had jaundice off and on for some years. One stated he had yellow eyes since birth. Abdominal pain and fatigue were common symptoms, along with the jaundice, dark urine and slight enlargement of the liver.

In many, the jaundice had flared up during an attack of some other sickness, such as scarlet fever or pneumonia, or under the stress of unusually hard work.

Chemical tests of the blood indicated something wrong with the liver. There was an abnormally large amount of the bile pigment, bilirubin, in the blood serum. X-ray examination after a dye had been given always failed to show the gall bladder. With signs of non-functioning gall bladder and of possible obstruction to the bile flow, the doctor of such a patient had "practically no choice" but to advise operation to see what was wrong and to remedy it if possible.

At operation, however, these patients always proved to have perfectly normal gall bladders and bile ducts and normal-looking livers, except for the color. This varied from green to greenish-black to slate blue.

This color is so characteristic that now a doctor taking out a bit of liver with a needle (a simple examination now made frequently for diagnostic purposes) can tell from the tiny disc he has removed that the patient has this new jaundice.

Examination of the tiny piece under the microscope shows the brown pigment that confirms the diagnosis.

Before Dr. Dubin's discovery, patients with this condition not only had needless operations and spent months in bed while doctors made every known test and tried every known treatment, they also would finally be sent home from the hospital with some grim-sounding diagnosis such as chronic viral hepatitis.

To some, this meant they were crippled and unfit as surely as if they had lost a leg. Some felt they could never work again and must have a pension. Others, young men in the Armed Forces, were disgusted at being kept off duty or separated from the service for an ailment that did not make

them feel sick except once in a while, and for occasional yellowing of skin and eye whites they had had all their lives.

The cause of the condition is not known. Drs. Dubin and Johnson believe it is some inborn defect of the liver that makes it unable to handle certain color chemicals, including the dye used to visualize the gall bladder under X-rays.

They stress that it is not serious and that the patients should not be operated on, and should not be converted into physical or mental cripples by a false diagnosis.

So far, 16 cases have been discovered, 12 of them in a check of about 5,000 medical records. While this is not a large number, Drs. Dubin and Johnson think there are many more that have not been recognized or have been misdiagnosed.

A full report of their findings appears in *Medicine* (Sept.).

Science News Letter, September 11, 1954

CHEMISTRY

Chemicals in Opium Ash Will Aid Drug Control

▶ A STOPPER for at least part of the world-wide narcotic drug menace has been discovered by Drs. J. C. Bartlett and C. G. Farmilo of the Food and Drug Laboratories, Canadian Department of National Health and Welfare, Ottawa.

The discovery is that the place where the raw opium came from can be determined by chemical analysis of the ash when the opium is burned.

Indian opium, for example, has high potassium and low calcium content in the ash. The druggist type of Turkish opium, on the other hand, has a high calcium and low potassium content.

Knowing the source of the opium should help tighten control measures and suppress illegal production in those areas of the world where the illicit traffic in opium originates, the scientists point out in *Nature* (Aug. 28).

Opium is produced from one species of poppy plant, *Papaver somniferum*, but the composition of its ash varies significantly, depending on the geographical origin of the opium. This variation in ash composition probably depends on varieties within the species and on such local features as soil, climatic conditions and agricultural techniques.

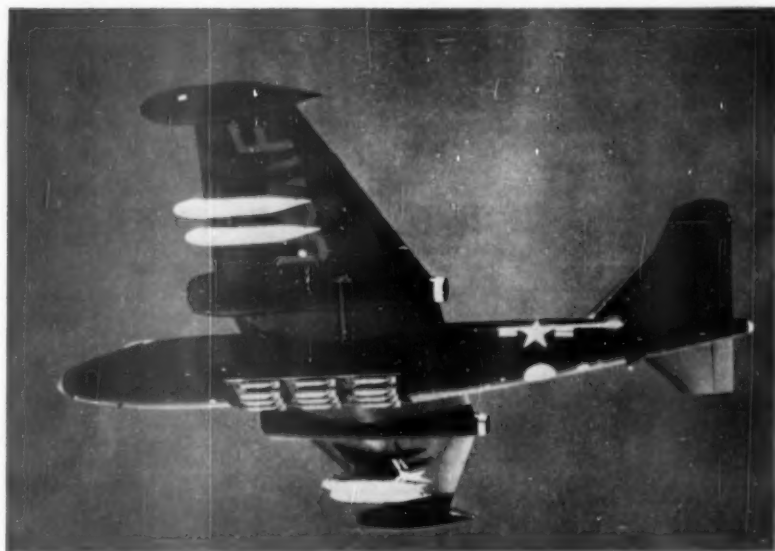
In Iran, the processing of raw opium probably has contributed to the variation.

The Canadian scientists have now analyzed more than 100 opiums from Yugoslavia, Turkey, Iran, India, Indo-China, Korea and China. Tests were made for both major and minor constituents.

The elements determined were potassium, calcium, phosphorus, sodium, magnesium, silicon, iron, aluminum, titanium, boron, manganese, molybdenum, lead, tin and copper. Spectrographic, colorimetric and flame photometric procedures were used.

The work was undertaken under a UNESCO program.

Science News Letter, September 11, 1954



WEAPONS FOR B-57—Some of the destructive fire power of the U. S. Air Force's Martin B-57 is revealed in this photograph showing the napalm tanks banging under its broad wings. The bomber, now in production, is equipped with a rotary bomb door, here shown open, for quick release of its bombs. The plane made its first appearance before the general public at the National Aircraft Show, Dayton, Ohio, over Labor Day weekend.

METEOROLOGY

Special Hurricane Research

► HURRICANE "CAROL," the season's third tropical storm, was the first to be probed by methods never tried before:

Constant-level balloons were released in the hurricane's "eye," and special radar methods traced its circulating wind systems.

Combining results from these new avenues of attack with exploratory methods previously used, weathermen hope to learn more about the energy sources of hurricanes as well as how to predict their paths more accurately. Their results will not be available for some time.

The scientists on this joint research project of the U. S. Weather Bureau and Air Force flew Bermuda-based planes, loaded with special equipment, into hurricane Carol's center, or "eye."

There they released constant-level balloons that can be tracked by radar in order to learn more about the nature of air currents in the "eye." With this information they can complete design on a hurricane beacon device that can be released in the center core of future storms, and then travel with them, sending out signals from which the "eye" could be tracked constantly.

This method of tracking would be particularly important as storms approach the coast line, since it would give more accurate prediction of exactly what areas will be hit by the hurricane gales.

The second new feature involved the use of special radar methods in order to study

the great squall lines, or rain bands, that spiral inward toward the center of the disturbance from the outer fringes. These squall lines are the portion of the storm that is visible to radar. With the new methods, the scientists were able to track air movements in all parts of the disturbance more accurately.

The special hurricane flights also explored the "steering current," which is a current of air in the high levels of the storm that seems to steer or point to the direction of the hurricane's movement.

The research project is the third special hurricane research program. The first, also in Bermuda, was in 1947. The second operated from Guam in 1951.

R. H. Simpson of the Weather Bureau heads the research team, which is using facilities and personnel of the 53rd Strategic Reconnaissance Squadron, Air Weather Service, with headquarters at Kindley Air Force Base, Bermuda. Maj. Lloyd Starrett, U. S. Air Force, represents the Air Weather Service in the joint project.

Science News Letter, September 11, 1954

About 23 persons die of cancer every hour.

New possibilities for using television in teaching deaf children have been demonstrated in the United Kingdom by recent experiments, UNESCO reports.

PSYCHOLOGY

Discuss Jobs for Those Over 65

► MEN AND women over 65, who are now being excluded from more and more jobs by age requirements and compulsory retirement plans, are being attracted in disproportionate numbers to certain jobs.

A survey of these jobs was reported to the American Psychological Association meeting in New York by Prof. Harvey C. Lehman of Ohio University.

You do not see many umbrella menders and scissors grinders any more, but when you do, the artisan is more than likely to be a man over 65. Whitewashers were on the way out as far back as 1890, but the census of that year showed a disproportionate number of old men working at that job, Prof. Lehman told the psychologists.

By contrast, new occupations and rapidly growing fields attract large numbers of young people, and this influx tends to decrease the proportionate numbers of their elders. Aeronautical engineers, for example, were not even listed in the census for 1940. In 1950, there were 17,034 aeronautical engineers, but only 0.07% of them were 65 or over.

Certain positions that require a long period of "working up" are over-represented by those over 65.

Among the jobs in which men over 65 contribute more than their share of the workers are gardeners, beekeepers, farmers, guards, watchmen and doorkeepers, cemetery keepers, charwomen (there is apparently no such word as charmen) and, at the other end of the scale, clergymen, bankers and brokers, city and county officials and judges.

Women over 65 seem to work as boarding house keepers, midwives, dressmakers, farmers and gardeners, fruit growers, fortune tellers, music teachers, physicians, religious workers and librarians.

Science News Letter, September 11, 1954

PUBLIC HEALTH

Fight Baby Epidemics With Washing Machines

► WASHING MACHINES of the kind used in homes for the family wash can help fight dangerous epidemics of diarrhea in hospital nurseries for children and babies.

The diapers come out clean and sterile, even without preliminary rinsing, and hospitals will be saved considerable money in diaper purchases and labor in handling them if they use automatic home laundry machines instead of the general hospital laundry. Studies showing this are reported in the *Journal of the American Medical Association* (Aug. 28) by Drs. Ernest H. Watson and James L. Wilson of the University of Michigan Medical School, Ann Arbor, Mich., and Dr. Arthur Tuuri of the Mott Foundation, Flint, Mich.

Science News Letter, September 11, 1954

PALEONTOLOGY

Ancient Reptile-Bird Glided Instead of Flew

► THE ARCHAEOPTERYX, famous part-reptile and part-bird extinct for 150 million years, did not fly but glided, the British Association for the Advancement of Science meeting in Oxford, England, was told by the director of the British Museum, Sir Gavin R. de Beer.

A re-examination of "the world's most precious, beautiful and interesting fossil," first described 90 years ago, shows that this famous intermediary between reptiles and birds did not have the muscles to allow vigorous and active flight. The creature glided rather than flew.

Ultraviolet light was used on the slab of Jurassic limestone encasing the famous fossil. Bones glow in this light while rock does not. Sir Gavin's inspection showed a poorly ossified sternum without a keel, which would have been present if there had been strong pectoral muscles.

The Archaeopteryx's brain under ultraviolet was found to be extremely small in size compared with modern birds, and did not have development necessary for control of real flight.

Science News Letter, September 11, 1954

ARCHAEOLOGY

Rare Gold Ornaments Found in Grave

► RESPLENDENT GOLD ornaments like those sought so avidly by the early Spanish explorers have now come into the hands of archaeologists.

These rare and spectacular treasures were found in a grave near Huarmey, about 160 miles north of Lima in Peru. They are described by Dr. Samuel K. Lothrop of the Peabody Museum, Cambridge, Mass., in *Archaeology* (Spring).

The grave dates from the Chimu period, 400 to 700 years ago, and contained the mummified remains of what was evidently a very important person. The presence in the grave of a gold slab used by goldsmiths for the rolling out of wax sheets for the "cire perdue" process indicates that the man buried there was himself a goldsmith and may have had a hand in making the metal objects buried with him.

Cire perdue casting is a technique still employed by jewelers and dentists that calls for knowledge and skill, and it must have been more difficult 700 years ago than it is now. Gold sheets can easily be trimmed with steel shears, but no one knows how Peruvians cut the metal before the invention of tempered bronze knives shortly before the conquest, Dr. Lothrop says.

The gold ornaments found attached to the mummy bundle and turning it into an effigy of the deceased are among the most complex and resplendent ever found, in Dr. Lothrop's judgment.

They consisted of a mask, a pair of

elaborate ear ornaments, a large breast plate and a number of loose sequins. All these objects were of gold alloy and much more elaborate than any others known. They were made by joining over 600 individual pieces of gold, including more than 200 danglers, suspended on projecting wires soldered to the background.

The ancient Peruvian people were worshippers of the sun. Gold ornaments were treasured because gold flashes in sunlight.

Science News Letter, September 11, 1954

OCEANOGRAPHY

Navy Ships Find Northwest Passage**See Front Cover**

► TWO UNITED STATES icebreakers have successfully plowed their way through the frozen ice of the Arctic to find the fabled Northwest Passage, a water route linking the Atlantic and the Pacific across the top of the world.

One of them, the USS *Burton Island*, is shown on the cover of this week's *SCIENCE NEWS LETTER*, as spotlights search for the best course through ice, which often was four to ten feet thick.

The *Burton Island* crushed its way through McClure Strait, while the other ship, the U. S. Coast Guard's *Northwind*, entered the strait from the Arctic Ocean, skirting along its southern edge.

Both ships are on a joint U. S.-Canadian expedition conducting oceanographic and hydrographic studies in that area. Scientists on the *Burton Island* collected sea water and ice for further analyses and tests.

The studies are part of the continuing research program designed to make the frozen wastes of the Arctic more accessible to military operations, thus strengthening one of the most vital links in our continental defenses.

Helicopters and "frogmen," Navy personnel who specialize in underwater demolition, were invaluable to the expedition. The helicopters helped to spot new routes through the ice, and also carried personnel ashore.

The frogmen helped to check the depth of ice fields, tested various explosives for blowing up ice, and tried out camera equipment designed for use in Arctic waters.

Science News Letter, September 11, 1954

MARINE BIOLOGY

Glands, Not Politics Turn Crayfish Red

► RED CRAYFISH have turned up in a scientific laboratory at the University of Missouri. Their color is glandular, not political. It resulted from doses of an adrenal gland extract which apparently destroyed the dark pigment that would have given them their usual black or gray color. The finding is reported by Drs. Max Goldman and Patrick H. Wells in *Science* (Aug. 27).

Science News Letter, September 11, 1954

IN SCIENCE

GENERAL SCIENCE

Name-Publicity Now Determines Prestige

► PUBLICITY RECEIVED by a person has taken the place of hereditary rank, position, and money and power in determining prestige, Dr. Lyman Bryson, professor emeritus of education at Columbia University's Teachers College, pointed out at the Fourteenth Conference on Science, Philosophy and Religion held at Harvard University.

The predominant American prestige-symbol, he said, is the appearance of one's real or professional name in print, and its sound in broadcasts. This pervading evidence that one's name has arrived and that the public is taking notice is sought for and enjoyed as the fruit of achievement.

To have name-publicity by accident or personal favor is considered good luck, not bad, Dr. Bryson commented, and it plays a bright part in the dreams of youth.

Science News Letter, September 11, 1954

ENGINEERING

Unique Building Model Simulates Heat Factors

► TO TRANSLATE comfortable living and working conditions into efficient, economical design factors, a unique model of a building has been constructed by Harry Buchberg, a University of California at Los Angeles engineer.

The model can reproduce electrically the factors involved in the cooling and heating of a structure.

It does not look like a building, but is a mass of wires and electronic gadgets. By turning a few knobs, engineers can determine the influence of a multitude of complex factors on the thermal behavior of a structure.

The material or color of the roof or a wall may be changed with a twist of a knob. Insulation may be placed in the walls or above the ceiling. The sun and wind can be turned on and off at will. In fact, the 24-hour climate cycle of any location can be duplicated by the electrical model in 48 seconds.

Use of the device by individual home builders to solve thermal design problems would be a little too expensive, Mr. Buchberg said, but it would be economically feasible for large construction projects.

Ultimate aim of his study is to compile information that can be used simply by engineers and architects to solve heating and cooling problems. The work is being supported by the American Society of Heating and Ventilating Engineers.

Science News Letter, September 11, 1954

CE FIELDS

BIOCHEMISTRY

Drug Mixture Awakens Sleep-of-Death Victims

► DISCOVERY OF a double drug mixture to waken people from the sleep of death brought on by overdoses of barbiturate sleeping medicines is announced by Dr. F. H. Shaw and associates of Melbourne, Australia, in *Nature* (Aug. 28).

Already some 20 patients have been rescued by the mixture.

The two drugs are beta methyl ethyl glutarimide, known as NP 13 for short, and 2,4 diamino 5 phenyl thiazole.

NP 13 is an antagonist to barbiturates. The thiazole compound, discovered about two years ago, is an antagonist to morphine but only slightly antagonistic to barbiturates. When given with NP 13, the thiazole compound reinforces the action of the NP 13 and adds the additional safety factor of counteracting the convulsions that large doses of NP 13 can cause.

Important feature of NP 13 is the fact that it counteracts the depressed breathing brought on by barbiturates. In some cases when NP 13 was given to counteract barbiturate overdose, the breathing rate was doubled for five to ten minutes after injection of NP 13.

Associated with Dr. Shaw in the discovery and testing of the new double drug mixture were Shirley E. Simon, N. Cass and A. Shulman of the University of Melbourne, and J. R. Anstee and Eva R. Nelson of Nicholas Ltd., Melbourne.

Science News Letter, September 11, 1954

ANTHROPOLOGY

Add Body Build Type to I.Q. Tests for Students

► STUDENTS APPLYING for entrance to universities may in future be rated by measurement of their body build, as well as by intelligence and aptitude tests and grades and examinations in various school subjects, Dr. R. W. Parnell of Oxford University, England, suggests in the *British Medical Journal* (Aug. 28).

Physical features, such as being big muscled or fat or lean, can promote or handicap the efficiency of the mental equipment to a surprising extent, he says.

Men with proportionately large bone and muscle development and, at a different extreme, fat men with very little muscle are found in American universities but not at Oxford, Dr. Parnell reports.

Among English university students he studied, "all-rounders," who both played games and did well in studies, had body builds just on the muscular side of the

picture for all the body build types among the students.

The ones who did best in scholastic work, taking "first class honours," were mostly endomorphic ectomorphs, that is, men with a physique on long lines, but with a tendency to fat.

Ph.D's in science tended to be built on long lines, but with rather large bone and muscle development. Men of this build did outstandingly well at winning awards, such as prizes and scholarships, upon entrance to the university, but in their final examinations did least well.

These contradictory findings may mean that these men were "over-taught" at school, or were late in maturing and so did poorly in the free university atmosphere, or looked so bright and eager that they "hoodwinked" the men selecting candidates for university courses.

Performance not only in school but in industry, the armed forces and life itself may be predicted to some extent with the aid of body build typing, called somatotyping, Dr. Parnell thinks. It may give information on academic failure and "the allied problem of mental disturbance."

Science News Letter, September 11, 1954

GENERAL SCIENCE

Urge Stopping Work Under Security System

► SCIENTISTS SHOULD refuse to work under the security system imposed by the government that resulted in the Oppenheimer case. (See SNL, July 10, p. 19, and June 26, p. 403.)

This work stoppage is advocated by Prof. O. Theodor Benfey, chemist of Haverford College, Haverford, Pa., in the *SSRS News-Letter* (Aug.), publication of the Society for Social Responsibility in Science.

There is great significance, in Dr. Benfey's opinion, in the fact that in the consideration of Dr. J. Robert Oppenheimer's security clearance by the Atomic Energy Commission only the lone scientist on the reviewing board and on the commission supported Oppenheimer.

"Everyone is now calling for a review of the security system," Dr. Benfey said. "But any scientist with a shred of insight could have predicted what would happen if scientists accepted the degree of secrecy now prevailing."

"They should have refused to work under the imposed conditions."

"Such a refusal would not have weakened the country; it would have led to an immediate review of the security system. But it would have required a certain amount of courage, the risk—not very great—of a few months of unemployment."

"Even now no one seems to be resigning. When will men learn that a country decays unless its citizens are willing to suffer for their convictions? Why should the government review the security system if it can get all the obedient servants it wants?"

Science News Letter, September 11, 1954

INVENTION

Buried Radioactive Ores Pictured by Camera

► AN X-RAY camera designed to snap pictures of radioactive ores buried deep in the earth has been awarded patent 2,688,095.

Uranium prospectors could use the device to photograph formations that Geiger counters detect. By studying the developed film, prospectors could get a better idea of the extent and richness of the ore.

Invented by John H. Andrews of La Mesa, Calif., the camera has a series of horizontal and vertical baffles to absorb all radiation not traveling parallel to the camera. Radiation passing through the baffles strikes a window of polystyrene or some other chemical that generates light when hit by radioactive particles.

Multiplier phototubes "see" the light flashes in the window and amplify them. They are passed on to a glow lamp in proportion to their brilliance. The glow lamp exposes the camera's film.

The camera is geared to scan the area under study. The glow lamp scans the film in synchronism so that the picture will make sense.

The camera works on X-rays, gamma rays and other radiations of extremely short wave lengths. It is able to picture ores of weaker intensity than present "pin hole" cameras can, thus widening the vistas for its users.

Science News Letter, September 11, 1954

NUTRITION

New Iodine Salt for Animals, Maybe Humans

► COWS AND other farm animals, and maybe humans as well, will get a new kind of iodized salt in the future if present tests prove successful.

Iodine is put into salt, for humans and other animals, to protect against goiter, the neck swelling that comes when the thyroid gland is not functioning right. The thyroid needs iodine for proper functioning.

Potassium iodide is the chemical now used to put iodine into salt and thus into people and animals that need it. However, potassium iodide is sometimes leached out of salt licks and animal feeds by moisture. Even that in table salt for human consumption may decompose, sometimes without moisture.

A copper iodine combination, cuprous iodide, is more stable and insoluble in water. Tests on laboratory animals at the Armour Research Foundation, Chicago, show this form of iodine is effective and safe, so it is being suggested for farm animals and livestock by Drs. Sidney Mittler and G. Harvey Benham.

Changing the iodine in table salt for humans will not come, however, until after exhaustive tests on animals. The iodine salt studies are being carried on under sponsorship of the Morton Salt Company.

Science News Letter, September 11, 1954

TECHNOLOGY

Good News For Tall People

The average American man is growing taller each generation. Gradual as it is, this change is being acted upon by many bed manufacturers and X-ray equipment makers.

By ALLEN LONG

► THE AVERAGE American man is growing taller with each generation. Army figures show that he grew six-tenths of an inch between World War I and World War II, adding nine pounds to his frame.

Although his stature has been slowly increasing, this change has not gone unnoticed.

Bed manufacturers recently decided that it was high time for some new standards. Army figures had tipped them off to the fact that the number of men who are five feet ten inches and over has increased 45% since 1918. The number over six feet has increased 70%.

This means that more and more uncomfortable men, and women, are being jackknifed into beds too small for their big-boned bodies. More sheets are pulling out from under mattresses, more persons are lying diagonally across their beds, and more feet are sticking out into cold winter nights.

Bed makers had been uneasily aware that the current standard bed, which is just right for a five-foot-ten-inch man, was rapidly becoming an anachronism. Odd-sized beds, mattresses, springs, sheets and blankets began appearing. They were snapped up by an uncomfortable public.

Meanwhile the National Association of Bedding Manufacturers foresaw the day when there would be a riot of bed sizes, shapes and descriptions on the market. They envisioned the time when a harassed housewife would be seeking out an odd-sized mattress to fit a bed made by some then defunct manufacturer.

Standards for "king-sized" beds were needed and, in consultation with the Commodities Standards Division of the U. S. Department of Commerce, the bedding manufacturers drew up new dimensions.

New king-sized beds will measure 82 and a half inches from end to end. Figuring in the usual six-inch margin, the extra-long mattress will comfortably sleep a man six feet four and one-half inches tall. It could completely accommodate a man six feet ten and one-half inches tall, but with no room to spare at the head or foot.

Already most of the nation's bed makers have adopted the standard for king-sized beds. Some now have them in production. The National Association predicts that most of its membership will be turning out extra-long Hollywood-type beds in time for Christmas.

Dr. T. Dale Stewart, physical anthropologist at the Smithsonian Institution in Wash-

ington, reports that people are becoming more and more aware of man's size—and the limitations his height imposes.

During the war, he said, aero-medics found that you could not build an airplane, jam it full of instruments, shoehorn a pilot into the cockpit and expect him to perform efficiently.

"The armed services called in a group of anthropologists to explore the brand-new field of human engineering," he said.

"Today many new airplane designs are routinely checked from the human engineering point of view. Scientists study a full-scale mockup of the new plane, and they fit the pilot into it."

If the pilot's knees knock against the throttle or if the pilot cannot freely move his head, something must be changed.

As planes are built to cruise longer distances non-stop, attention must now be paid to the design of pilots' seats so that long hours of sitting will not cause fatigue or "pins and needles" from impeded circulation.

There is a growing emphasis today on this new science—on fitting a machine to man's physical and mental limitations. Adjustable seats in automobiles and simplified controls on factory equipment are cases in point.

One X-ray manufacturer has marketed a new machine with a seven-foot-long table especially designed to accommodate tall patients.

Even your school-aged children may be made more comfortable because this science is growing in prominence.

W. Edgar Martin, a specialist in school furniture and equipment, has tabulated basic body measurements of boys and girls from four to 17 years old for the U. S. Department of Health, Education and Welfare. The booklet was prepared to provide school officials, architects and design engineers with meaty facts and figures.

However, the figures and measurements will probably have to be rechecked in 40 or 50 years. They will go out of date because man's body is itself changing.

Why is man growing taller? Will he reach an eventual "ceiling"? If not, will he fall prey to his size, like dinosaurs, and become extinct?

These are some of the questions that



A TALL CLIENTELE—Even clothing stores are now set up especially to serve the taller-than-average customer. Shown here are two employees of Tall Apparel Shops, Inc., Washington, comparing one of their "queen-sized" suits with a standard suit held by the woman in the middle. Note the difference in sleeve and skirt lengths.

anthropologists are asking themselves. There are many speculative answers to them, but it is thought that diet and mate selection favor an increase of stature of the American. Some anthropologists even think that man may reach a height of about eight feet in thousands of years.

No one really knows why man is growing taller. Most persons believe a number of things are working together to increase his stature.

One angle of the theory is that a well-fed baby stands a good chance of reaching a real physical maturity. A child who eats but does not get the proper nutrients is likely to be stunted.

Anthropologists point to small-sized immigrants who entered this country in the last century. Some of them came from a poor economic and nutritional status in the old country. Their new environment in America did not change their adult physiques, but their children "sprung right up," as one anthropologist has said. Even the children's heads were shaped differently in comparison to their parents'.

Another popular finding that helps explain the ever-increasing average height is mate selection. Tall persons seem to prefer tall mates. Offspring of these unions thus would tend to inherit tall statures.

There is a general feeling that giantism is a physical specialization that leads to extinction. Whereas the bulky dinosaur perished, however, the mammoth whale has survived. This may be because the whale's large body is supported by water.

It is difficult for anthropologists to say how man's height has been changing through the ages. The body armor that soldiers wore centuries ago might yield a few clues, but even these tangible fragments of the past do not give definite conclusions about their wearers' statures.

Hundreds or thousands of such suits of armor would be needed for anthropologists to draw a valid conclusion as to the average height of the 15th Century soldier, and only a relative few have been found.

It will be many hundreds of years before man's height "ceiling" will be attained—if it is attained. Meanwhile man has a more pressing problem. He must figure out how to live until then without destroying himself with his H-bombs.

Science News Letter, September 11, 1954

NEW! SPITZ, JR. PLANETARIUM



ONLY
\$15.00
POSTPAID

EXPLORE THE MYSTERIES of the NIGHT SKY . . . Right in Your Own Room

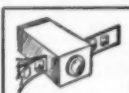
A Great Teaching Aid!

See Over 70 Constellations, 400 Stars

Designed by Armand Spitz, world-famous maker of the Spitz Planetarium. Projects nearly 400 stars, more than 70 constellations in their correct relationships. Use it in any darkened room of the house, project it on walls and ceiling. No batteries, works on ordinary household current. Two simple adjustments that show you the sky as it appears from any point in the Northern Hemisphere . . . for any time of night . . . for any month of the year! Rheostat control for brightness.

A 32-PAGE BOOK INCLUDED FREE OF EXTRA COST. Contains valuable information about the stars, provides easy identification of the constellations. Planetarium is about 14" high on a 7" base. Projection sphere 7" diameter. Weight 3 lbs.

Stock #70,040-Q . . . \$15.00 pp



SIMPLE LENS KITS!

Fun for adults! Fun for children! Kits include plainly written, illustrated booklet showing how you can build lots of optical items.

Stock # 2-0-10 lenses . . . \$ 1.00 Postpaid
Stock # 5-0-45 lenses . . . \$ 5.00 Postpaid
Stock # 10-0-80 lenses . . . \$10.00 Postpaid



ASTRONOMICAL TELESCOPE KIT

Mt. Palomar
Type Telescope

Makes excellent classroom project. All optical parts completely finished—only require mounting (no metal parts included). Kit consists of 4 1/2" aluminum F/11 reflecting mirror—lenses for eyepiece—front surface mirror for diagonal. Mirror in kit is guaranteed to give the theoretical maximum definition. This combination will give you a 45 power telescope, which power is best for all around viewing. Finished instrument will be worth \$75 to \$100. By using supplementary eyepieces, available at small extra cost, you can get up to 190 power. Directions included.

Stock #50,074-Q . . . \$16.25 Postpaid

POPULAR OPTIC SERIES

"How to Make It" Instruction Booklets.

Wonderful for classroom and club use . . . group projects.
Easy to follow—accurate—8 1/2 x 11 page size—many illustrations. Do-it-yourself—Save! and have Fun!

	Stock No.	Price Postpd.
How to Build Projectors	9014-Q	30¢
Homebuilt Telescopes	9008-Q	40¢
Method to Clean Precision Optics	9024-Q	15¢
Homebuilt Riflescopes	9018-Q	30¢
ULTRA CLOSE-UP Photography	9042-Q	60¢
Infra-Red Light and Its Uses	9040-Q	75¢
Homemade Stereo Adapters	9032-Q	30¢
Homemade Stereo Viewers	9034-Q	30¢
Photo Microscopy with Pen	9029-Q	10¢
Dummy Camera	9035-Q	20¢
Collimating Systems	9031-Q	15¢
"Building a Condenser Enlarger"	9038-Q	40¢
"All About Telephoto Lenses"	9036-Q	60¢

Order by stock No. Send Check or M.O. Satisfaction Guaranteed!

New! 2 in 1 Combination Packet-Size

50 POWER MICROSCOPE and

10 POWER TELESCOPE

ONLY \$4.95 ppd.



Useful Telescope and Microscope combined in one amazing, precision instrument. Imported! No larger than a fountain pen. Telescope magnifies 10 Power. Microscope magnifies 50 Times. Handy focus at any range. Handy for sports, looking at rare objects, just plain snooping.

Send Check or M.O. Satisfaction Guaranteed

Order Stock #30,089-Q . \$4.95

IMPORTED MICROSCOPE

Low Price Yet Suitable for Classroom Use!



ONLY \$14.95 100, 300, 500 Power

Good optical qualities. Fine focusing. Definition is surprisingly clear and good . . . in fact amazingly so at this price. Revolving disc-light, adjustable mirror. Square Stage (2 1/2" x 2 1/2") with slide clamps. Serviceable construction. The

greatest microscope bargain on the market! TRY IT FOR 10 DAYS . . . if you're not completely satisfied your money will be refunded in full. Instrument comes packed in sturdy, hardwood case. Accessory Eyepieces and objective available.

Stock No. 70,008-Q . . . \$ 14.95 Postpaid

FREE! Clip this ad for 93-page book "Hunting with the Microscope" sent free! Regular advertised price 60¢. Limited time only!

GET FREE CATALOG #Q—World's largest variety of Optical items. Excellent for Xmas Gifts! Bargains galore . . . War Surplus—Imported—Domestic Microscopes, Telescopes, Hand Spectroscopes, Prisms, Lenses, Reticles, Mirrors and dozens of other hard-to-get Optical items. Ask for FREE CATALOG #Q.

SEND FOR
Free Record
START SPEAKING
FRENCH
SPANISH
ALMOST OVERNIGHT!

HERE'S the easiest way to learn FRENCH, SPANISH, Russian, German, Italian, Japanese or Brazilian. Listen to FREE 2-sided non-breakable record. Let your eyes follow words in FREE sample lesson. Almost at once you'll be chatting in a new language with a perfect accent! That's all you hear! No memorizing needed. Just listen—imitate! It's that easy! Offer may end soon. Rush 25¢ to help cover cost of special packaging, shipping. State language you want. We'll also send free information on full Cortina course. CORTINA ACADEMY, Dept. 809, 136 W. 52nd St., New York 19.

EDMUND SCIENTIFIC CORP., BARRINGTON, N. J.

THE EYE REMEMBERS—THE EAR FORGETS!

Take advantage of this truism by teaching scientific principles with **MINERALIGHT** ultra-violet lamps

Short wave 2537 A.U. - Long wave 3660 A.U.

For: Classroom,
Laboratory or Field

Especially valuable in
**MEDICINE—
CHEMISTRY—
PETROLEUM—
CHROMATOGRAPHY—
TEXTILES—MINERALIGHTS and MINERALS**



Ideal for mineralogy students. Beautifully packaged fluorescent minerals. 10 identified specimens in each package. 10 select packages for easy visual study. Includes 24-page booklet on fluorescent minerals.

Write for Mineralight catalog, bulletin N "The Ultra-Violet Lamp in Education" and folder on fluorescent minerals.

ULTRA-VIOLET PRODUCTS, Inc.
145 Pasadena Ave., South Pasadena, Cal.

The New Electro-Magnetic
DORMIPHONE
YESTERDAY—SCIENCE FICTION
TODAY—ASTOUNDING
REALITY! A Great
Scientific Discovery

A REVOLUTIONARY
All-in-One
Invention for

- Faster Learning
- Magnetic Home Recording
- Superb Listening Enjoyment

• Memory Training Today, for the first time, an ingenious device does for you what no machine has ever done before!

The invention of the **ELECTRO-MAGNETIC DORMIPHONE** by Max Sherover, president of Lingaphone Institute, ends a ten-year search for the perfect multi-purpose machine. Would you like to increase your rate of learning 20% to 50% by making use of periods of relaxation and sleep? Now it is easy; you can master a new language, improve your speech, memorize a role in a play, learn useful facts and figures with less time, less effort. Would you like to make your own recordings at home—without spoons or wire or tape... all these uses in addition to more listening pleasure out of your favorite records makes the new all-in-one Dormiphone the most versatile, 3-speed, portable phonograph ever assembled!

FIND OUT ABOUT ELECTRO-MAGNETIC DORMIPHONE

Proof of what the New **ELECTRO-MAGNETIC DORMIPHONE** can do for you is fully set forth in a FREE Booklet, "A New Dimension in Learning." Write today **DORMIPHONE, MODERNOPHONE, INC.**, 125-00 RCA Building, New York 20, N. Y.

MAIL COUPON NOW

MODERNOPHONE, INC. (Dormiphone Div.)
125-00 RCA Building, N. Y. 20, N. Y.
Gentlemen: Please send me your FREE Booklet, "A New Dimension in Learning."

☐ If under 17, check here for Special Booklet A.

Name

Address

City

Zone

State

My main interest in Dormiphones is for

☐ Learning a Language ☐ Speech Improvement

☐ Memorization ☐ Home Recording

☐ Listening Enjoyment

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AMERICAN NURSING: History and Interpretation—Mary M. Roberts—Macmillan, 688 p., illus., \$6.00. The editor of the *Journal of Nursing* writes this account of the profession for the 50 years covered by that periodical.

BEGINNING FARMERS: A Vulnerable Group in American Agriculture—Robert K. Buck—National Planning Association, Planning Pamphlet No. 88, 28 p., paper, 50 cents. The million young families who have begun farm careers since the war have special need for help, particularly in better training in management of farms.

THE DESIGN AND USE OF INSTRUMENTS AND ACCURATE MECHANISM: Underlying Principles—T. N. Whitehead—Dover, 2nd ed., 283 p., illus., cloth \$3.95, paper \$1.95. Written primarily for designers of instruments and for those who use them.

DESIGN OF FLEXIBLE PAVEMENTS: Presented at the Thirty-Third Annual Meeting, January 12-15, 1954—Fred Burggraf and W. J. Miller, Eds.—Highway Research Board, Research Report 16-B, 77 p., illus., paper, \$1.05. Describing actual experiences with pavements built in accordance with the different methods of design.

ing actual experiences with pavements built in accordance with the different methods of design.

A DEVOTION TO NUTRITION—Frederick Hoelzel—Vantage, 88 p., \$2.50. The author gained prominence at an early age for his exceptionally long fasts. He is now assistant in physiology at the University of Chicago.

DICTIONARY OF INTELLECTUAL PROPERTY—A. John Michel and Kurt Kelman—Research, Patents & Trademarks, 352 p., \$12.00. Definitions of terms used in applying for patents, trademarks, etc., and also information about the laws. Under "Title," for example, is the information that titles of books cannot be copyrighted.

DOWN TO THE SHIPS IN THE SEA—Harry Grossett—Lippincott, 256 p., illus., \$3.75. Exciting experiences of the author who has been a deep sea diver for 50 years and who, at the age of 70, is still diving. The author also describes modern improvements in diving and submarine rescue methods.

ELEMENTARY TEACHERS GUIDE TO FREE CURRICULUM MATERIALS—Patricia A. Horkheimer, Paul T. Cody, and John Guy Fowlkes, Eds.—Educators Progress Service, 11th ed., 332 p., paper, \$5.50. New titles, 454 of the 1,256 listed, are marked with an asterisk.

ELEMENTS OF NUMBER THEORY—I. M. Vinogradov, translated from the fifth revised edition by Saul Kravetz—Dover, 227 p., cloth \$3.00, paper \$1.75. Provides a detailed "first course" in number theory without resorting to advanced mathematics. First English edition.

EMOTIONS AND BODILY CHANGES: A Survey of Literature on Psychosomatic Interrelationships 1910-1953—Flanders Dunbar—Columbia University Press, 4th ed., 1192 p., \$15.00. During the recent decades of specialization, many of the most vital problems have developed in the no-man's land of "between fields." Now new specialties, among them psychosomatic medicine, have grown up to study such problems.

THE FERNS AND FERN ALLIES OF MINNESOTA—Rolla M. Tryon Jr.—University of Minnesota Press, 166 p., illus., cloth \$4.00, paper \$2.75. A handbook of identification describing the 92 different kinds of ferns that are native to Minnesota, and telling how to collect and preserve specimens.

FIBERGLAS REINFORCED PLASTICS—Ralph H. Sonneborn, Albert G. H. Dietz and Alton S. Heyser—Reinhold, 240 p., illus., \$4.50. Technical information about a new building material.



EARNED \$400 FIRST YEAR

"Last year I made around \$400 and it was the first year I started to write. Your course is the best way to get expert instruction in professional writing."—T. Edward Karlsson, 224 East 79th St., New York, N. Y.

How Do You Know You Can't Write?

HAVE you ever tried?

Have you ever attempted even the least bit of training, under competent guidance?

Or have you been sitting back waiting for the day to come when you will awaken all of a sudden to the discovery "I am a writer?"

If the latter course is the one of your choosing, you probably never will write. Lawyers must be law clerks. Doctors must be interns. Engineers must be draftsmen. That is why the Newspaper Institute of America bases its writing instruction on journalism—continuous writing—the training that has produced so many successful authors.

Learn to write by writing

Newspaper Institute's New York Copy Desk Method starts and keeps you writing in your own home. Your writing is individually corrected and constructively criticized. Under such sympathetic guidance, you will find that you are rapidly correcting your own distinctive, self-flavored style.

Many potential writers become awestruck by fabulous stories about millionaire authors and, therefore, give little thought to the \$25, \$50 and \$100 or more that can often be earned for material that takes little time to write—series, articles on science, scientific papers, sports, local, church and club activities, etc.—things that can easily be turned out in leisure moments.

A Chance to test yourself—FREE!

Our unique Writing Attitude Test tells whether you possess the fundamental qualities necessary to successful writing. You'll enjoy taking this test. The coupon will bring it FREE without obligation. Newspaper Institute of America, One Park Ave., New York 16, (Founded 1925) (Licensed by State of New York.)

FREE NEWSPAPER INSTITUTE OF AMERICA

One Park Avenue, New York 16, N. Y.
Send me without cost or obligation, your FREE Writing Attitude Test and further information about writing for profit.

Mr. ☐ Mrs. ☐ Miss ☐
Name

Address

City

Zone

State

(All correspondence confidential. No salesman will call on you.)

☐ Check here if Veteran. 117-P-604

Copyright 1953 Newspaper Institute of America

STOP BEING CONFUSED!

Free Book! New Book tells all about High Power **BINOCULARS** Know BEFORE you buy

Nearest Precision Optics 25 Million Tools 23 Models \$9.95 to \$125 Guaranteed Savings Ask for Dealer's Home Dept. 876 43 E. Green Pasadena, Calif.

RUSHNELL Binoculars

FILL OUT! Mail TODAY!

NAME

ADDRESS

CITY

STATE

FORERUNNERS TO EVEREST: The Story of the Two Swiss Expeditions of 1952—René Dittert, Gabriel Chevalley and Raymond Lambert, translated by Malcolm Barnes—*Harper*, 256 p., illus., \$4.00. Sir John Hunt in the preface acknowledges the debt of the British climbers to their Swiss predecessors of 1952.

THE GEOMETRY OF RENE DESCARTES: With a Facsimile of the First Edition 1637—Translated by David Eugene Smith and Marcia L. Latham—*Dover*, 243 p., illus., cloth \$2.95, paper \$1.50. This new edition provides an opportunity for students to study both the original of this classic and the Smith-Latham translation.

A HISTORY OF MECHANICAL INVENTIONS—Abbot Payson Usher—*Harvard University Press*, Revised ed., 450 p., illus., \$9.00. Acknowledging the debt of the Western World to early China.

LIGHTING HANDBOOK—*Westinghouse Electric Corporation*, rev. ed., 250 p., illus., paper, ring binding, \$2.50. Data in a convenient form for engineers, architects, and electrical contractors.

THE MAN IN THE THICK LEAD SUIT—Daniel Lang—*Oxford University Press*, 207 p., \$3.50. These chapters, originally published in the *New Yorker*, were written by a layman for other laymen to tell them how some Americans have learned to live with the atomic bomb. The

"thick lead suit" is a symbol for the limitations of human imagination which mercifully prevent a man from full realization of the meaning of modern and future weapons.

ON THE SENSATIONS OF TONE AS A PHYSIOLOGICAL BASIS FOR THE THEORY OF MUSIC—Hermann L. F. Helmholtz, Translated and revised for music students by Alexander J. Ellis—*Dover*, 2nd ed., 576 p., illus., \$4.95. This classic is reprinted more than 90 years after its first publication.

PEOPLE TO PEOPLE DIPLOMACY: An Approach to a Peaceful World on a Person-to-Person Basis—International Educational Exchange Service—*Govt. Printing Office*, Department of State Publication 5492, 29 p., illus., paper, 20 cents. During the past year there were 7,121 exchanges with over 70 countries of the free world. Two-thirds of the persons came to the United States to study, teach or to do research work.

PLASTICS ENGINEERING HANDBOOK—The Society of the Plastics Industry, Inc.—*Reinhold*, 2nd ed., 813 p., illus., \$15.00. This new edition has been expanded to nearly twice the size of the earlier one.

THE SOCIAL BACKGROUND OF POLITICAL DECISION-MAKING—Donald R. Matthews—*Doubleday*, Doubleday Short Studies in Political Science, 71 p., paper, 95 cents. In spite of the

tradition that any American boy can become President, only four percent of our presidents, vice-presidents and cabinet officers have been the sons of wage earners or laborers, but 38% have been the sons of farmers and an equal proportion, sons of professional men.

Science News Letter, September 11, 1954

MATH IS FUN

By Joseph Degrazia, Ph.D.

Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!

CONTENTS: Trifles—On the Borderline of Mathematics—Faded Documents—Cryptograms—How Old Are Mary and Ann?—Wolf, Goat and Cabbage—and Other Old Coincidences—Clock Puzzles—Trouble Resulting from the Last Will and Testament—Speed Puzzles—Railroad Shunting Problems—Agricultural Problems—Shopping Puzzles—Whimsical Numbers—Playing with Squares—Miscellaneous Problems—Problems of Arrangement—Problems and Games—Solutions. Many delightful and helpful illustrations.

Solutions were needed

Large Book • 150 Pages • 150 Hours of Fun
\$2.75 • 5-Day Money-Back Guarantee

EMERSON BOOKS, Inc.

Dept. 103-K, 251 W. 19 St., N. Y. 11

WHERE TO RETIRE TODAY and AFFORD IT

3 books that give you the facts on where
you can retire today on the money you've got

Where Will You Go In Florida?

Florida needn't be expensive—not if you know just where to go for whatever you seek in Florida. And if there's any man who can give you the facts you want, it's Norman Ford, founder of the world-famous Globetrotters Club. (Yes, Florida is his home whenever he isn't traveling!)

His big book, *Norman Ford's Florida*, tells you first of all, road by road, mile by mile, everything you'll find in Florida, whether you're on vacation, or looking over job, business, real estate, or retirement prospects.

Through his experienced advice you learn exactly where you can retire now on the money you've got, whether it's a little or a lot. (If you need a part-time or seasonal job to help out your income, he tells you where to pick up extra income.) Because Norman Ford always tells you where life in Florida is pleasantest on a small income, he can help you take life easy now.

If you're going to Florida for a job with a future or a business of your own, his talks with hundreds of business men and state officials, etc., lets him pinpoint the towns you want to know about. If you've ever wanted to run a tourist court or own an orange grove, he tells you today's inside story of these popular investments.

Yes, no matter what you seek in Florida, this big book (with well over 100,000 words and plenty of maps) gives you the facts you want. Price—only \$2, only a fraction of the money you'd spend needlessly if you went to Florida blind. Use coupon to order.

BARGAIN PARADISES OF THE WORLD

West Indies, Mexico, Californias Abroad
This is a book on how to double what your money can buy. For that is what spending

a few weeks or months, or even retiring, in the world's Bargain Paradises amount to. And why not when you can retire to the:

Azores or the Canaries—islands of tropical flowers, sandy beaches, and the charm of Old Spain—with rents of about \$20 a month, groceries for a couple at \$10 a week, and servants \$5 a month each.

The lotus-covered mountain lakes of Kashmir, where a furnished houseboat with four turbaned servants rents for \$70 a month. Total costs for a couple run about \$175 a month—in the most beautiful spot on earth.

The South Seas? Tahiti has found out about the Yankee dollar. But there's brilliant Sigatoka Beach at Suva or reef-girt Norfolk or Lord Howe Island, the Bargain Paradises of the South Seas today.

Throughout this big book you learn where to spend a while in the West Indies, Mexico (where living costs dropped 33% when the peso was devalued last spring), South America (today's bargain counter for Americans), the healthful islands of the South Seas, the wonderlands of New Zealand, the marvelous Balearic Islands where two can live like kings for less than \$35 a week.

You read about cities and towns where it's always spring, about "Californias Abroad," about "Four Modern Shangri-Las," about mountain hideaways, tropical islands as colorful as Tahiti but nearer home, about modern cities where you can live for less, about quiet country lanes and surf-washed coastal resorts.

If you've ever wanted to travel but wondered how you could afford it; if you have a little income but wonder how you'd ever be able to retire on that; if you want a life of luxuries on what you'd get only necessities back home, then you want this book, *Bargain Paradises of the World*.

96 photos, 4 maps. 1954 edition. Price \$1.50.

WHERE TO RETIRE ON A SMALL INCOME

This book selects out of the hundreds of thousands of communities in the U. S. and its island territories only those places where living costs are less, where the surroundings are pleasant, and where nature and the community get together to guarantee a good time from fishing, boating, gardening, concerts, or the like. The book never overlooks the fact that some people must get part-time or seasonal work to pad out their income.

It covers cities, towns, and farms throughout America—from New England south to Florida, west to California and north to the Pacific Northwest. It includes both Hawaii and the American Virgin Islands. Some people spend hundreds of dollars trying to get information like this by travelling around the country. Frequently they fail—there is just too much of America to explore.

Where to Retire on a Small Income saves you from that danger. Get the big 1954 edition costs only \$1.

Mail this coupon for prompt delivery

Mail to HARIAN PUBLICATIONS
15 Scranton St.,
Greenlawn (Long Island), N. Y.

I have enclosed \$..... (cash, check, money order).
Please send me the books I checked below. You will
refund my money if I am not satisfied.

- ☐ Bargain Paradises of the World, \$1.50
☐ Where to Retire on a Small Income, \$1
☐ Norman Ford's Florida, \$2.

Special offer: all books above (\$4.50 value) for \$4.

Print Name

Address

City & State

Questions

ANTHROPOLOGY—What was the probable source of the African ape-man's first fire? p. 164.

□ □ □

CHEMISTRY—How can the country of origin of opium now be spotted? p. 166.

□ □ □

GENERAL SCIENCE—How is prestige now determined by Americans? p. 168.

□ □ □

MEDICINE—How was a new kind of jaundice recently discovered? p. 166.

□ □ □

OCEANOGRAPHY—What is the Northwest Passage? p. 168.

□ □ □

PALEONTOLOGY—What travel method did the archaopteryx use? p. 168.

□ □ □

Photographs: Cover, U. S. Navy; p. 163, Illinois Institute of Technology; p. 165, Sperry Gyroscope Company; p. 167, The Glenn L. Martin Company; p. 170, Fremont Davis; p. 176, Minnesota Mining and Manufacturing Co.

BOTANY

NATURE'S RAMBLINGS



Survival of the Unfit

► AUTUMN IS a time for seed-scattering among wild plants, but among cultivated varieties it is a time for harvesting and gathering into barns. In the wild, seed-pods open and shake out their contents as wind and animals rattle the stalks.

Ripe burrs catch on the hair or wool of

animals—especially, it seems, after we have sheared the latter and are wearing the spoils to clothe our own too-sparsely-covered bodies. Winged and parachuted seeds are taking their final flights down the wind. All the thousand devices that accomplish dispersal are at work.

Only the seeds of grain and other food-plants chosen by man are discouraged from dispersal by every means at the breeder's command. If the heads of wheat or barley or rye break up and let go their grain, as grass seed naturally scatter, the agronomist reports disgustedly to the geneticist, "This kind shatters!" — and the offending variety is straightway discarded, or at least bred into tight-clinging docility.

If bean-pods or clover-heads shed their contents without waiting for the thresher, a like fate awaits the strains to which they belong.

Among the commoner crop plants, probably the one that has most completely lost its ability to let go of its own seed is corn. This has been artificially selected by farmers, both white and Indian, for so many generations that all resemblance to its original wild condition has been lost. And in no respect has its ability to look out for itself been more completely lost than in the way its many-rowed cob clings to the grain.

Not even in warmer countries, where the seed would not be winter-killed, does corn escape from cultivation and run wild, as other plants occasionally do.

If man has become greatly dependent on his cultivated plants for his survival, they have become utterly dependent on him. He must thresh out their seeds, saving a part from his ovens and pots to be planted the following year. He must fight weeds, insects and fungus diseases to enable these green vassals of his to survive and reproduce.

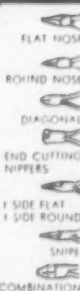
If a suicidal nuclear Armageddon should wipe out mankind, it would be only two or three seasons at most until practically all of his principal crop plants would be extinct, too.

Science News Letter, September 11, 1954

QUALITY TOOLS at a Savings up to 60%

ONLY 75c EACH FOR FINEST IMPORTED PRECISION PLIERS

For Jewelers, Optical Workers, Hobbyists, Craftsmen of all kinds. These superb German instruments are of drop-forged, heat-treated high quality tool steel, fabricated, ground and polished to most exacting specifications. Smooth working joints. Jaws meet perfectly to hold the most delicate objects. Each plier is 4" long and a gem of precision and strength. 7 types to choose from: Flat Nose, Round Nose, Snipe, Combination, Diagonal, End Cutting Nippers, or 1 Side Flat and 1 Side Round. 75c each



13 Pc. HIGH SPEED DRILL SET
Made of finest hardened tool steel. Especially designed for High Speed electric drilling through the hardest metal, steel and wood. Full jobbers lengths and are packed in a sturdy metal index. Sizes by 64ths. from 1/16" to 1/4". Made to sell for \$3.98 our price only \$2.98.



6 Pc. POWER AUGER BIT SET

Made of finest tool steel specially tempered and hardened to give years of quick, clean, easy drilling. Shanks will fit all electric drills. Packed in sturdy, heat-treated, compartmented plastic tool roll. Sizes: 3/8", 1/2", 5/8", 3/4", 7/8", and 1". \$2.29 complete set postpaid



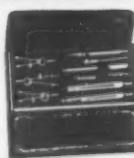
ALUMINUM LINE & POCKET LEVEL

Made of hard aluminum tubing, 3/8" x 1/2", hexagonal shape, with 2 sturdy hooks for hanging on line. Equipped with luminous vial, tested for accuracy. 49c pp.



11 Pc. DRAFTING SET

High lustrous chrome plated instruments of outstanding quality and accuracy. Set includes Plain and Ringhead Bow Dividers, Compasses for use with ink or pencil, Ruling Pens and all necessary parts. Packed in a velvet lined, snap button closure, simulated leather case. Complete Set — \$3.29 postpaid



6 Pc. METAL CUTTING FILE SET

Made from the best quality tool steel, designed for the requirements of mechanics, instrument watch and jewelry craftsmen. Compartmented plastic kit contains the following 3 1/2" long needle files with round shanks and high test cutting qualities: round, half-round, flat, oval, knife, square. 98c complete set postpaid



4 Pc. DROP-FORGED TANG CHISEL SET

Swedish pattern, of high quality tempered and hardened tool steel. Blades beveled and polished. Hardwood, leather tipped handles. Set contains one each 3/4", 1/2", 3/8" and 1" chisel in plastic compartment kit. Complete Set — \$2.95 postpaid



POLISHED STEEL VERNIER CALIPERS

Imported precision instrument of 6" measuring capacity with inside and outside jaws, depth gauge and friction roller adjustment. Graduations 1/16" and 1/32". vernier readings 128". \$1.39 postpaid



12" WORK BENCH LEVEL

Made of hard-wood beech, kiln dried and lacquered. Equipped with horizontal and plumb vial. Horizontal vial covered with a steel plate NFL. 59c pp.



\$1 MINIMUM ORDER, SEND CHECK OR MONEY ORDER. IF C.O.D., YOU PAY POSTAGE AND C.O.D. CHARGES. MONEY BACK GUARANTEE IF NOT COMPLETELY SATISFIED.

SCOTT-MITCHELL HOUSE, Inc.

611 BROADWAY, DEPT. 811
NEW YORK 12, N. Y.

ILLUSTRATED CATALOG
HUNDREDS OF TOOL & TOOL KITS 25¢ REFUND ON FIRST ORDER

LISTEN and LEARN A LANGUAGE by 20 MINUTES A DAY

World's Standard Conversational Method
FRENCH RUSSIAN SPANISH JAPANESE GERMAN GREEK
—29 Languages available

At Home learn easily, quickly by the LINGUAPHONE CONVERSATIONAL METHOD. It's like living in another country. You LISTEN—you hear native men and women speak—you understand—you SPEAK, correctly as they do. Worldwide educational endorsement: a million home-study students. Write for FREE Book, "Passport to A New World of Opportunity."

SEND FOR
FREE
BOOKLET

LINGUAPHONE INSTITUTE
3109 RCA Building,
New York 20, N. Y.

Send me your FREE book.

Language Interest

Name

Address

City..... Zone..... State.....

THE NATIONAL AUDUBON SOCIETY

INVITES YOU TO ENJOY

A New Educational Nature Hobby For The Entire Family!

Here is an exciting way to enrich your children's lives—and your own—with knowledge of the wonders of nature!



In summer, the snowshoe rabbit is the same color as his tundra home. But when autumn comes . . .



. . . the weather gets colder, and he starts to change color! When the ground is covered with snow . . .



. . . he has become all white—perfectly camouflaged once again!

THIS revolutionary "Museum-at-Home" program, sponsored by the National Audubon Society, has captured the imagination of thousands of families.

The Free Gift described below (Value \$2.00) will introduce you and your family to a thrilling new experience. Now you can discover the wonders of Nature at home, under the guidance of friendly, inspired naturalists.

Each month, with the aid of magnificent color photographs and fact-filled albums in which to mount them, you journey "into the field" on a fascinating quest after Nature's secrets. You see how Nature "protects her own" with camouflage . . . follow the migrations of sea birds across the wide oceans . . . learn the

strange, almost unbelievable ways in which some animals rear their young. *Best of all, your naturalist-guides will show you how to find amazing wonders in your own back yard or park!*

The whole family will look forward to each of these monthly Nature Program sets with the greatest interest. Here is a hobby in which Mother, Dad and the children all participate, and from which all can profit. Few family activities can offer so much at such low cost.

You can "sample" this new program without any obligation. Send the coupon today, for the current set CAMOUFLAGE IN NATURE as a FREE GIFT.



A Wonderful FAMILY HOBBY

Everything supplied . . . including fascinating pictures in natural color . . . permanent albums to mount them in . . . suggestions and plans for outdoor projects . . . and a handsome case to protect your collection.



In an ordinary woodland pond you can find an amazing variety of fascinating creatures. Your Nature Program tells you what to look for, how to go about it.



FREE IF YOU ENROLL NOW
The Current Album
CAMOUFLAGE IN NATURE

Right now is an excellent time to find out about this new National Audubon Society program. Send the coupon at once for the current set, CAMOUFLAGE IN NATURE, ABSOLUTELY FREE OF CHARGE. Your Free Gift set includes a collection of thirty-one natural color prints, informative album and a distinctive maroon-and-gold color case to protect your collections. The value of this sample Gift Package is \$2.00.

You assume no obligation when you send for this FREE set. You may resign your en-

rollment any time you wish. However, we feel sure that once your family has become acquainted with the "Museum-at-Home" program you will wish to continue these delightful monthly "visits" for a while. The total cost is very low; only \$1 for each set plus a few pennies for shipping.

In any case, we urge you to send for your FREE set and case now, as quantities are limited. Print your name and address on the coupon and mail it today.

THE NATURE PROGRAM

Dept. 5NL-9, Garden City, N. Y.

Please send me FREE the CAMOUFLAGE IN NATURE series including 31 natural color prints, and an album to mount them in, plus informative text. I understand that you plan to issue a new Nature series each month, in cooperation with the National Audubon Society, for only \$1.00 each plus a small charge for shipping. You will immediately send me, without any charge, a handsome maroon-and-gold color case for my albums. After examining my FREE set, I'll notify you if I do not wish any others. I may cancel my subscription at any time I wish without further obligation.

Name _____ (Please Print)

Address _____

City _____ Zone _____ State _____

SEND NO MONEY. MAIL COUPON PROMPTLY.

(Same offer in Canada; address 105 Bond St., Toronto 2, Ont. Good only in U.S.A. and Canada.)

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 743. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

☼ **THREE-SPEED TURNTABLE** features a unique design which, if viewed under strobe or fluorescent light, appears to stand still when the turntable is moving at precisely the proper speed. Rim driven, the turntable is cast of aluminum so as not to exert pull on magnetic cartridges. The unit is designed to fit conventional record changer boards.

Science News Letter, September 11, 1954

☼ **HOLDER FOR fishing pole or fresh-water rod and reel** allows the fisherman to eat lunch or just relax without interrupting his fishing. Once the aluminum gadget is pushed securely into the ground and the fishing pole attached, the mechanics of fishing are reduced to reeling in the fish.

Science News Letter, September 11, 1954

☼ **LIQUID RUBBER** will waterproof anything from a boat bottom to a convertible car-top. Applied like paint, the rubber coating will provide a good grip on a baseball bat, will shockproof tools, weatherproof ignition wires, and will even undercoat a car. The liquid, which is resistant to heat and cold, comes in black, green, red and a transparent shade.

Science News Letter, September 11, 1954



☼ **BLACK PAPER** tape, available in widths up to 36 inches, protects smooth surfaces during outdoor storage up to six months in duration. The protective tape, shown in the photograph, is easily applied

from a roller directly onto the item to be protected, and sticks upon contact to aluminum, most plated metals, plastics or glass.

Science News Letter, September 11, 1954

☼ **COFFEE MAKER** which pressure brews coffee below the water level is designed to save coffee (and money). Any cooking vessel becomes a coffee-pot when this small unit is placed in it. The coffee maker brews up to eight cups of coffee, using any grind of coffee.

Science News Letter, September 11, 1954

☼ **ORNAMENTAL GRILLEWORK** screens from view the window air conditioner that juts outside. The grille, made of aluminum in an oak leaf design and finished in high gloss white enamel, is adjustable to any size window and can be installed easily.

Science News Letter, September 11, 1954

☼ **CIGAR HOLDER** houses a removable filter that reduces the nicotine and tar content of the smoke. The holder pierces the cigar and thus makes it unnecessary to bite off the ends. Complete with enough filters for 350 smokes, the unit is sold in a clear plastic gift case.

Science News Letter, September 11, 1954

☼ **PORTABLE INTERCOM** system's installation consists of just plugging it into any AC or DC outlet. The wireless system will transmit voices up to two and one-half miles and allows communication between separate buildings.

Science News Letter, September 11, 1954

The new style approach
to a contemporary world of science . . .

CHEMISTRY

CHEMISTRY brings you vital news, the meaning and facts of the latest developments in chemistry and related fields . . . with intricate verbiage cut out for easy reading and understanding. This necessary information for living knowledgeably in your world comes to you in a dramatic, pocket-sized magazine.

Published 9 times a year, September through May, (one issue a big special one)—\$4.00 per year.

We invite you to try CHEMISTRY because we believe that you will want to keep on getting it for a long, long time. Send in your subscription order promptly and we will send you a copy of the revised, up-to-date PERIODIC TABLE.

Order NOW from:

SCIENCE SERVICE
1719 N Street, N.W.
Washington 6, D. C.

Do You Know?

About one of every 15 infants is allergic to milk to some degree.

Electrical stimulation of a nerve that controls breathing is a valuable technique in treating respiratory failure such as that caused by polio.

A U.S. Navy blimp recently spent 200.2 consecutive hours in the air to establish a new world's endurance record for non-stop flight of aircraft and crew without refueling.

A female cockroach often discharges her eggs when she is at the point of death.

Due to consolidation, there are only about half as many school districts in the United States as there were in 1932.

Spontaneous dog cancers appear in about the same places in dogs as in humans, and in about the same ratio.